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Maine Agricultural Experiment Station

ORONO

BULLETIN No. 162 DECEMBER, 1908

INSECT NOTES.

This bulletin contains brief accounts of the more important insects of the year 1908.

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AGRICULTURAL EXPERIMENT STATION
ORONO, MAINE.

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BULLETIN No. 162.

INSECT NOTES FOR 1908.*

EDITH M. PATCH.

The present bulletin, like others of the series, is concerned with certain insects of Maine which have come especially to the notice of the Station during the current season. In some cases the records are merely statements of insect situations which it may never be desirable to spend more time upon; in other instances the records serve as a preliminary note of species to be dealt with more fully at some future time. The summer of 1908 has been one of tremendous insect interest; the devastation of thousands of acres of hard wood forests by the saddled prominent; the prevalence of almost innumerable other species of caterpillars; the conspicuous appearance of pine insects, many of them usually rare, at a time when the pines are weakened from other causes; the noticeable great numbers and extent of aphid infestations; the continuation of grasshopper depredations; may be mentioned among the insect disasters of the season. Over against this we have as a bit of encouragement, the noticeable increase of predaceous and parasitic insects all over the State and late in July and in August a pretty general occurrence of a contagious fungus disease which struck various species of caterpillars like a plague, killing them by wholesale and thereby diminishing in many localities the danger of the succeeding generation.

For many items of interest the Station is indebted to people from different parts of the State who have kindly submitted important material. Such aid, although considerable, is too miscellaneous and disconnected to acknowledge separately and it is hoped that Insect Notes for 1908 will be accepted as a statement of appreciation of whatever suggestions or aid have been given the Station this year.

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* Papers from the Maine Agricultural Experiment Station; Entomology No. 32.

So far as practicable "remedial measures" are not discussed here for the reason that descriptive circulars dealing with the standard injurious insects of the State are always on file to be mailed to persons requiring such information.

Station notes were recorded this season for something over 300 lots of insects, selections from which are contained in this bulletin. The Lot numbers here given are merely reference to Station records for the species in question and have no significance beyond permanently linking the published account to the Station collection and notes which is in some cases desirable.

The Gypsy and Brown-tail Moths.

As dangerous insects in this State, these moths are of first rank. Little need be recorded of them in this present bulletin as they are discussed adequately in so much constantly available literature. Descriptive circulars are sent out both by this Station and the Maine Department of Agriculture and the United States Department of Agriculture in reply to inquiries. For information concerning their present status and the work in progress against them for this State the reader is referred to the annual reports of the State Entomologist. The annual report of the Superintendent for Suppressing the Gypsy and Brown-tail moths in Massachusetts, are of no less interest to the neighboring states, as the gigantic experiments with introduced parasitic and predaceous enemies of these moths concern not the one state alone but the country at large which will benefit from the successful work carried on there. The value of such work cannot be over estimated either from the standpoint of scientific or practical demonstration.

While the owners of infested trees are for the most part alive to their responsibility as individuals, now and then careless owners of neglected trees still harbor the winter nests of the brown-tail moth evidently trusting to the fates or the State to prevent the consequences. The latter is proving itself willing to help most materially and that the fates are also propitious is indicated by specimens of a predaceous bug (nymphs of probably *Podisus modestus*) received with a nest of brown-tail moths from Stroudwater, Maine, September 4, 1908, together with the comment that there were "one or more in each of the 5 nests examined, feeding upon the young caterpillars."

THE SADDLED PROMINENT, *Heterocampa guttivitta* Walk.

By far the greatest amount of damage caused by any single species this season was due to the saddled prominent caterpillar. So enormous was the work of this insect that it seemed expedient to discuss it in a bulletin * by itself and it is mentioned here merely to include it among the insects of the year. A newspaper circular from this station was sent into the districts most infested about the middle of July, with a description of the pest and such remedies as were applicable to shade and orchard trees.

Associated with the saddled prominent the two species next to be mentioned were present in greatest numbers.

THE ROSY-STRIPED OAK-WORM, *Anisota virginiensis* (*pellucida*). Lot 309.

Found feeding upon several trees but everywhere especially upon the oak which they completely strip, is a darker relative of the green-striped maple worm. In many localities the work of the saddled prominent was greatly augmented by these two caterpillars. This oak worm is variable as to color but in general it may be described as a dark grey or greenish larva with dull brownish yellow or often brick red lateral stripes, and the skin is dotted with small white warts. A row of short black spines occurs on each segment and there are two long spines on the second thoracic segment. The winter is passed in the pupa similar to that of the maple-worm and in the same situation,—among fallen leaves beneath the trees the caterpillars have stripped.

The moth emerges early in June. Professor Comstock's description is quoted:

"The wings of the female are purplish red, blended with ochre-yellow; they are very thinly scaled, and consequently almost transparent; and are not speckled with small dark spots. The wings of the male are purplish brown, with a large transparent space on the middle." The male is considerably smaller than the female.

Figures 41, 42 and 43 represent the caterpillar and the moth of this species.

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* Maine Agricultural Experiment Station Bulletin No. 161.

THE GREEN-STRIPED MAPLE-WORM, *Anisota (Dryocampa) rubicunda.* Lot 325.

So numerous upon the maple have been these caterpillars for two seasons, in many cases entirely defoliating the trees, that the following description and accompanying illustrations are given. "The larva measures when full grown about one and one-half inches. It is pale yellowish green, striped above with 8 very light, yellowish-green lines, alternating with 7 of a dark green, to black. There are two prominent spines on the second thoracic segment, and two rows of spines on each side of the body, one above and one below the spiracles, and on the 8th and 9th abdominal segments there are four prominent dorsal spines." *

The species passes the winter in the pupa state and pupæ were commonly found in the same situations as those of the saddled prominent under the fallen leaves in the infested maple growths. The moth which emerges in the spring (for Maine about the first of June) is an exquisitely beautiful moth with wings of pale yellow banded with rose pink.

Symmerista (Edema) albifrons.

The White Tipped Moth. Lot 386. Among the forest caterpillars this season, the larva of this moth was very common. This caterpillar was taken on oak, birch and other trees. "It is smooth and shining, with no hairs. Along each side of the back there is a yellow stripe, and between these, on the back, fine black lines on a pale lilac ground; on each side below the yellow stripes there are three black lines, the lowest one just above the spiracles. The head is orange-red; and there is an orange-red hump on the eighth abdominal segment." (Professor J. H. Comstock-Manual). The conspicuous orange-red at each end of the caterpillar together with its rather peculiar shape make it a little puzzling to tell whether one of these caterpillars is traveling backward or forward.

* Professor J. H. Comstock. Manual p. 349.

A New Spruce Tortrix, *Argyroploce abietana* Fernald.

Lot 237.

Spruce twigs with the needles dead and webbed together in a silken mass were received from South Paris, May 20, 1908, with the complaint that two small spruces were much injured in that way. See Fig. 44. The inside of the leaves had been eaten out by the larvæ which entered by a hole made near the base of the leaf. The webbed mass contained small felty cocoons with greenish pupæ inside. Upon request a considerable mass of the webbed twigs was sent from the same place and over 40 of the numerous moths which emerged were mounted. These were not previously in the Station collection and were submitted to Doctor C. H. Fernald who kindly named and described * them. The females differ in no conspicuous marking from the males described by Doctor Fernald. The wing expansion, however, should read 11-13 mm. instead of 21-23 mm. as appearing by mistake in the original description. The accompanying photographs Figures 45 and 46, will give a general idea of the color pattern of this species. The fore wings might be briefly and graphically described as being composed of alternate irregular transverse bands of brown and bluish or silvery white. Accompanying the description of the male moth Doctor Fernald quotes Miss Rose L. Davis concerning the larvæ as follows: "The larvæ, when full grown, are about 7 mm. in length, cylindrical in form, with the head of medium size, of a shining yellowish-brown colour, and with a few fine hairs scattered over the surface. The rest of the body is of a light greenish-brown colour, semi-transparent. The thoracic and anal shields are of a pale greenish colour, with the usual fine hairs on these and over the surface of the body. When disturbed they quickly let themselves down by a silken thread."

The cocoon is a firm gray structure about 7 mm. in length and covered with pellets of frass.

The moths began to emerge May 29, so that it would seem probable that there are two broods a season. Since the cocoons are made among the webbed twigs the most practical remedy would seem to cut and burn such branches before the last of May. This would be applicable to shade and ornamental spruces and would prevent or greatly reduce the succeeding generation.

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* The Canadian Entomologist, Oct. 1908, p. 349.

A NEW NOCTUID FOR THE APPLE, *Crocigrapha normani* Grote. Lot 40.

During the season of 1907 larvæ of an undetermined species were bred upon apple in the insectary. These pupated about mid-July and in the spring a single moth emerged in the laboratory. This was identified by Doctor Harrison G. Dyar as *Crocigrapha normani* Grote, who stated that nothing was recorded of the life history of this species. Some descriptive notes in regard to the earlier stages which had been made by the writer have been published elsewhere,* and need not be further recorded here.

Acrobasis (Phycis) rubrifasciella. Lot 264.

About the midle of June most of the sweet fern in the vicinity of Orono and also at Lewiston was found to be attacked by these caterpillars which constructed trumpet shaped tubes. These tubes were composed of silk into which were woven more or less regular circles of dark frass pellets. The more perfectly formed trumpets were beautiful structures. Later the open mouths of the trumpets were closed before the larvæ pupated so that the cases were then rather oval in structure. Several masses of these were gathered and July 11, 1908, the moths began to emerge. The wings expand about 3-4 inch. When the moths are at rest they hold their wings curled about the body and the antennæ are stretched back straight against the mid-dorsal line.

On June 29 apparently the same sort of cases were received from Dexter, Maine, where they were taken from white birch.

Deilephila galli.

Sphinx caterpillars on *Galium verum.* Lot 298. One of the most curious of the season's collections was made July 16 when a bunch of yellow or ladies bed-straw was brought into the Station with about 20 young sphinx caterpillars upon it. This introduced plant was in full blossom and growing in profusion over a limited area. The caterpillars upon it were about 1 1-2 inch long with head and body bright green. See Fig 47. There was a mid dorsal yellowish white unbroken line, and a similar yellowish line just ventrad the spiracles. Midway between

* Entomological News. July 1908, pp. 321, 322. Plate XIII.

these two lines was another yellow line of the same width broken by 9 reddish spots edged with a curve of black along the sides, the posterior pair of red spots forming a Y with the caudal spine for the stem. These larvæ were unknown to the writer in this stage as was the plant upon which they were found, and it was after a half day's search that either was placed when, curiously enough, both were located on colored Table 7 of *Die Raupen der Schmetterlinge Europas* by Hofmann-Spuler.

The fact that this sphinx had discovered, in a Maine meadow, the first bit of this European plant known to appear in this locality and one of its favorite food plants in Europe seemed particularly interesting. Within a few days the caterpillars molted and were then the characteristic color of full fed *D. galli* (*chamoenerii*) larvæ which the writer had taken on fire weed (*Erechtites hieracifolia*), strawberry leaves and other plants previous years. That the *Galium verum* was a favorite diet is evidenced by the difficulty with which these caterpillars were induced to feed upon other plants when the supply of "bed straw" gave out. Several plants reported for this sphinx were tried but the caterpillars, after reveling in the sweet scented yellow blossoms of the *Galium,* sturdily declined leaves of any sort and were tempted only by the blossoms of fireweed, on which they fed until they pupated. Figs. 48, 49, and 50 picture moth, pupa, and full fed caterpillar of this species.

Datana major. Lot 394.

Several of these handsome caterpillars were received from Harrison, Maine, August 27, 1908, where they have been numerous upon "Deerberry," (*Vaccinium stamineum*) for two seasons. They fed in the insectary upon common low blueberry. The writer is not aware that this species has been previously reported from Maine. The specimens received were black bodied with 4 heavy longitudinal lines of pure white, broken into subquadrate spots. Head and cervical shield deep rich red, anal plate and prolegs red, the thoracic legs red at the base but the distal portion black. The body was thinly covered with short black hairs and longer whitish ones. The caterpillars assumed the characteristic Datana attitude, resting with both extremities raised, sometimes slightly, sometimes nearly meeting over the body.

Ogdoconta cinereola.

Bean Worm. Lot 231. This is a slender naked green caterpillar, pale with darker longitudinal stripes, measuring when full fed a little more than an inch in length. It was troublesome over the greater part of the State on beans this year, in many cases stripping the vines bare of foliage and pods. At the slightest touch they give a series of violent jerks landing on the ground. Their contortions are laughable even when their depredations are serious. Their habit of jerking off from the plant would seem to make killing them upon the ground practical, or in gardens to which hens have access merely shaking the infested vines for the benefit of the hens might prove a sufficient remedy. With shell-beans arsenical sprays would be practicable.

Alcothoe caudata.

Clear winged moths (Lot 322) were common flying about blossoms of Virgin's Bower (*Clematis virginiana*), August 3, 1908, at Mercer, Maine. The moths were mating at that date. The larvæ of this species bore in the stems of clematis.

Estigmene acraea and *Diacrisia* (*Spilosoma*) *virginica.*

The hairy "yellow bear" caterpillar of these two species were overwhelmingly troublesome in vegetable and flower gardens all through the State this year.

Basilona imperialis.

The Imperial Moth. Lots 329 and 379. Two full fed larvæ of this moth were received this season on white pine, the one from Naples, Maine, August 11, being the bright yellowish green variety, and the one from North Berwick, August 15, being dark brown. See Figure 51.

Lapara bombycoides.

Pine Hawk Moth. Lot 315. Several larvæ of this moth were received on white pine. This striking caterpillar is particularly inconspicuous in its natural habitat, as when it lies longitudinally along the pine needles—its normal attitude—the green stripes have so much the appearance of the needles that the insect is not noticeable. See Figure 52.

Dibolia borealis Chev.

Plantain Flea Beetles. Lot 279. Every season the bronze green flea beetles of the plantain, *Plantago major,* are found feeding upon the leaves of this plant early in the season and again later in the summer. This year they were found very plentiful near Portland mating May 25. At Lewiston, July 3, plantain leaves thoroughly mined, (See Figure 53) were found over an area of several square rods. The leaf miners in the trails were at that time full fed. A collection of leaves was made and the larvæ deserted the trails and buried themselves in the earth furnished them for pupation. On July 27 several of the fully developed beetles had emerged from the soil and proved to be *Dibolia borealis* Cherv. (=*aerea* Melsch). This beetle passes both the larval and adult life on the plantain. Whether there is a second brood for Maine has not been ascertained.

Oberea bimaculata.

The Raspberry Cane Borer. Lot 261. For the past two seasons this insect which had been very little in evidence for some time came to the front again. The writer is informed that about 12 years ago the injury by this borer to blackberry canes in this State was quite extensive, and it is blackberries that have been most attacked for the past two seasons although both at Orono and elsewhere the raspberries have been taken also. One man explained: "The tops of my blackberries kept lopping down and I thought at first the children were doing the injury in thoughtless sport. But I sat where I could watch the vines one day and saw several tops go down without apparent cause. When I looked at these lopping canes I found two magic rings upon them. The thing is pure witchcraft," the owner of the canes added with a puzzled laugh.

Two "magic" rings (See Figure 54) are indeed at the base of the drooping portion of all canes affected in this manner. They are about one-half inch apart and are the two rows of punctures made by the adult beetle with her jaws. Between them the beetle makes a small hole through which she deposits her egg.

Were the drooping tops the end of the injury usually not much damage would be done but the grubs which hatch from

the egg bore down the cane. Professor Slingerland's excellent account * of the work of this boring is as follows:

"They are cylindrical, footless, yellowish grubs, measuring about three-fifths of an inch in length. When first observed in the latter part of July they had made in each case a burrow less than two inches in length; but after that date the burrows were rapidly extended downward so that they became in many cases two feet or more in length and reached the base of the canes. The burrows are about one-eighth of an inch in diameter; they wind from side to side of the pith, and at frequent intervals penetrate the woody part of the cane. In some of the cases where the woody part of the cane is penetrated an opening is made through the bark. These openings occur at intervals of a few inches throughout the length of the tunnelled portion of the cane; they are small, being about one-third of the diameter of the burrow; and their object is to enable the larva to deposit its excrement outside of the burrow. It is evident that the larva puts the caudal end of the body at this opening and forces the excrement directly into the open air, for it was found in long strings, some of them a half inch in length, on the sand below the openings; and the burrows were always free from it."

The remedy is obviously simple. As soon as the tops begin to wilt the affected cane should be cut off below the lower ring and destroyed. If this is consistently attended to in the spring the insect will be killed in the egg before any real injury by boring is done. When the trouble is not noticed until later in the season all affected canes should be pruned to the ground and burned.

On June 29, 1908, some canes in the University garden showed evidence of the work of this insect and July 3 the beetle was observed at work. July 8, raspberry canes that grew close by the blackberry bushes showed the girdlings by the beetle.

From Bridgton, Maine, September 28, 1908, came the following communication: "I am about to send you red raspberry tops in which are some small whitish grubs. The first signs of these grubs are noticed about the middle of July. A couple of rings of holes appear near the tops of some of the new canes. The tops wither and the grubs bore down the inside toward the

* 1890. Bul. Agric. Exp. Sta. Cornell University. Entomological Division XXIII.

earth. I have found them when they have bored nearly the whole length of the cane."

The beetles pass the pupal stage at the roots of the cane and emerge in the spring. The beetle has a narrow black body about long, the thorax is yellow, with 2 small black spots sometimes absent, while in some specimens there is an additional black spot at the posterior margin of the prothorax.

Among the accounts of this insect might be mentioned that of F. M. Webster * who observed it boring in apple and in witchhazel and that of O. Lugger.**

Osmoderma scabra Beauv.

The Rough Flower Beetle. Lot 399. In an old orchard where the apple trees were being cut a considerable number of the white grubs of this beetle were found. About 10 of these were kept the winter of 1907-08 in the laboratory living in a section of decaying apple trunk to which no other attention was given than soaking it up now and then. Two of the beetles emerged during the winter and to the others were added about 20 more grubs of various sizes during the summer of 1908. These lived in confinement with very little care and were kept until the edible portion of the trunk had been disposed of.

Although these grubs do not occur in healthy trees, they sometimes cause considerable injury by consuming the wood of old trees and inducing more rapid decay.

Figure 56 pictures the cell which this grub constructs by cementing together "sawdust" inside which cocoon it passes its pupal stage and from which it emerges in the winged or beetle stage.

Figures 55 and 57 give the grub and beetle.

Dermestes vulpinus Fab. Lots 227 and 400.

Two infestations of this Dermestid were reported. They were breeding in "tankage," that is refuse from a rendering place, to be used as a fertilizer. They were also at work in curd from dried buttermilk. The buttermilk is evaporated, the curd pressed, dried, ground, and put into two bushel sacks to be used for sizing paper. It was in these sacks that the beetles

* 1898. Bulletin No. 96. Ohio Agricl. Exp. Station.

** 1899. Fifth Annual Report of the Entomologist of the Experiment Station of the Univ. of Minn.

were breeding enough to be troublesome. The species was determined by Mr. Schwarz through the courtesy of the United States Bureau of Entomology.

Corticaria ferruginea Gyllenhal Lot 291.

Dense swarms of these minute beetles occurred at Orono in the early evening of July 13, 1908. At that time a forest fire was raging west of Orono and the wind was from the west at the time the beetles were taken. Whether the beetles were escaping from the burning district or whether this circumstance was merely a coincident was not ascertained.

Brachys aerosa.

These Buprestid beetles (Lot 249) were common upon oak the leaves of which they were eating in the vicinity of Portland May 25, 1908. The larvæ are leaf miners. The beetles were by no means so numerous as last season in the same localities, as recorded on p. 270 of Bulletin No. 148 of this Station.

Dendroctonus terebrans.

The Turpentine Bark Beetle, Lots 244 and 300, were abundant at North Fryeburg, May 29, about windows and were reported in numbers from East Denmark, July 14.

Monohammus titillator * Lot 302. Sub. 1.

Monohammus scutellatus Lot 302.

Two of these pine borers were received from Ross Corner, July 17, with the comment "They had about stripped one side of the tree" (a small white pine). Being in doubt as to whether the stripped pine was the work of these beetles, as sawflies were pretty generally numerous, the writer placed the beetles in a jar with fresh pine twigs and they very soon began to chew along and through the needles, strewing the bottom of the jar with the needles which they had nipped through.

* Determined by Mr. Schwarz through the courtesy of the United States Bureau of Entomology.

Cryptorhynchus lapathi.

The Poplar and Willow Borer. Lot 327. This insect which has been a serious pest in other states was observed on the campus for the first time in 1907, a single specimen being taken from a willow hedge, June 7. This season from the same hedge these beetles were taken in several collections. On August 10 the females were observed chiefly upon new growth and some were found with beaks buried in the bark. At this date also they were mating.

Conotrachelus nenuphar.

Plum Curculio as an Apple Pest. One of the most serious apple pests in the State is the plum curculio. Besides the young apples which fall in quantities and in which the weevils develop, the fruit remaining upon the trees is so often and so generally deformed that it is seriously injured. As is the custom of the Station in regard to orchard pests, a circular of information concerning the work and remedies for this insect is used for full reply to questions about injuries due to the curculio.

Aphrophora parallella.

The Parallel Spittle-Insect, Lots 319 and 326. In June, deposits of white froth were observed generally upon the white pines of the State and the young insects found in the froth were frequently received with the question "are these the cause of the 'pine blight?'" The full grown insects were abundant on the white pine in the vicinity of Sebago Lake late in July, and the specimens were determined by Mr. Heidemann through the courtesy of the Bureau of Entomology, Washington, D. C.

Eriopeltis festucae.

The Cottony grass-scale was present as usual which means parasited as usual. It could be found in localities where it has been observed previous seasons but there were no complaints of serious injury to meadows.

Leptoterna dolobrata.

This meadow insect could be swept up by hundreds in the net about June 30 in the Orono grass lands. They exhibited great variation both in color and in length of wing covers.

Canthophorus cinctus Lot 392.

August 26, great masses of the red and black nymphs, in several stages and the black and white adults of these bugs were found congregated under chips and bits of rubbish. This seems to be the hibernating habit of this species as such masses are frequently met with late in the fall.

Anasa tristis.

Squash bug. Strangely enough, the specimens sent from Gorham, Maine, July 14, 1908, were the only specimens of these squash bugs received by this Station in 5 years.

Lygus pratensis.

The tarnished plant bug, Lot 308, was present among blackening and withering tips of potato vines at Waldoboro, July 20 where it was reported to be "working quite extensively in potato fields."

Podisus modestus.

Surely this species of soldier bug deserves honorable mention as it was busily engaged in stabbing destructive caterpillars during the entire season, over all parts of the State.

Aphididae.

The plant louse collections have been more than 100 this summer and the material has been of considerable interest including some new species as well as unrecorded forms of named species. The dry warm season has proven a favorable condition for aphid life and the weather was particularly good late in September and October when the true sexes are to be found. As is to be expected, parasitic and predaceous enemies of the aphids were abundant and many infestations were controlled by such natural enemies.

Nematus erichsonii and Other Sawflies.

Larvæ of the Larch Sawfly, Lot 383, were taken at West Houlton, July 7, 1908. Sawflies of many species seemed especially common upon the wing this season, and a considerable number of undetermined species were collected.

Lophyrus abietis.

Spruce Sawfly. Lot 323. "All the fir trees in this vicinity are dying" was the complaint which accompanied large sendings of cocoons of the spruce sawfly from Orrs Island and some other localities this season. The sawflies emerged about September 9, 1908. This is a well nigh impossible pest to fight in the woodland and the very serious trouble of this season added to last season's attack by the same species is rendered a little more hopeful by the fact that parasites emerged this spring from cocoons which were received from Seeket last year. The attack seems to have been more general upon the fir than the spruce.

Hymenopterous parasites.

Tiphia inornata, Lot 228, parasitic upon the white grub, were very numerous. Cocoons of these beneficial insects were received from South Thomaston, April 30, with the statement "I am planting new ground to potatoes and find an unusual quantity of the enclosed."

Chelonus sp. were bred from the tiny spruce tortrix, *Argyroploce abietana* Fernald. *Ichneumon sublatus* bred from the saddled prominent, was noticeable in woodlands all over the State. At Norridgewock as many as 10 or 12 were frequently to be found resting upon a single plant, about the first of August. At Mercer, August 3, one of these parasites was observed to be sipping honey-dew globules from a poplar leaf when an ant about one-third its size rushed at it and the Ichneumon took to its wings in haste. This comedy was repeated several times, as the Ichneumon would return to the feast of the honey-dew.

Pimpla pedalis also emerged from pupæ of the saddled prominent this spring.

As for parasites in general they were so abundant this season as to seem a prediction of fewer caterpillars another year.

Grasshoppers.

As was the case last year grasshoppers have been seriously troublesome this season. The red-legged locust, *Melanophus femur-rubrum* and *M. bivittatus* were guilty of most of the mischief, though the grasshopper kind in general were numerous and industrious. Among the other grasshoppers collected

this season as determined by Mr. Caudell through the courtesy of the U. S. Bureau of Entomology, are the following species *Nomotettix cristatus* Scudd. *Tettigidea lateralis polymorpha* Burm. *Camnula pellucida* Scudd. *Encoptolophus sordidus* Burm. *Stenobothrus curtipennis* Harr. *Stenobothrus curtipennis longipennis* Scudd. *Melanoplus collinus* Scudd. *Xiphidium fasciatum* De Geer.

At Mercer not far from the center of "the grasshopper region" the predaceous beetles, *Amara obesa,* was observed. As the larva of the beetle is credited with "devouring great numbers of locust eggs" its presence is one hopeful sign.

The grasshopper mites, *Trombidium locustarum,* bright red mites were present upon the grasshoppers of this locality being crowded particularly thicker about the regions of the wings.

Possibly correlated to the grasshopper scourge is the increase of the blister beetles, *Macrobasis unicolor* and *Epicauta pennsylvanica,* both species troublesome to potatoes and other crops but probably paying for such damage by the good which their larvæ do in eating such dangerous material as the eggs of locusts.

Fungus disease disposed of large numbers this season as last in spite of the dry weather.

Fungus Disease of Insects.

Late in July and early August it was observed over a region extending at least from Franklin to York counties that the caterpillars then feeding were overtaken by a contagious fungus disease. An account of such an attack of the saddled prominent is cited elsewhere.*

"White Pine Blight."

On account of the precarious condition of white pine in certain parts of the State considerable alarm has been aroused by various insects found upon the pine this season and indeed it has seemed as though an unusual number of species had taken advantage of the pines this year.

Besides the standard borers to be continually reckoned with, the pine sawflies and pine leaf eating caterpillars have made

* Me. Agric. Exp. Station Bulletin No. 161.

noticeable inroads, while spittle insects and plant lice (*Lachnus strobi* and *Chermes pinicorticis*) have been unusually prevalent.

None of these insects, however, have been the cause of the "white pine blight," * though several of them *Chermes pinicorticis* and the spittle insects, *Aphrophora parallela*, for instance, have been in some cases conspicuously associated with the ailing trees.

Eriophyes fraxiniphila Hodgkiss
and
Eriophyes fraxini (Karp.) Nal.
Ash Clusters and Gall Mites. Lot 429.

In the vicinity of Orono the red ash is commonly covered with distorted growth somewhat of the appearance of "witches' broom." Figure 58. In some cases these clusters hang from every branch and give the tree a strange appearance after the leaves have fallen. Examination of one such cluster taken October 10, 1908, revealed thousands of microscopic mites, some transparent and some pinkish, moving over the irregular surface. Similar galls are recorded by Murray as the so-called clusters of ash,† caused by an unnamed mite.

The mites that cause the physiological disturbance in the plant tissue which results in this erineum or gall are so small as to be almost invisible to the unaided eye. Examination of the gall under a Zeiss binocular gives a very interesting glimpse of these minute creatures on the gall and reveals the characteristic movements of the mites as well as their color and a general idea of their form. An oil emulsion, however, is necessary to give any definite details.

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* A discussion of the "white pine blight" is given by W. J. Morse in a forthcoming bulletin of the Maine Agricultural Experiment Station, and by the same authority under the title "The White Pine Blight in Maine" in the Report of the State Forest Commissioner of Maine, 1908.

† "They are the monstrous deformed styles of the flower, which gather into a ball, brownish green at the beginning, later on a dark brown, causing rough masses on the upper part, which have on the outside a great similarity to fragments of the upper part of a cauliflower. Its upper side is clothed, as it were, with colourless hair cloth, from which come stick like hairs. They are solid, without any hollow space, and, in a dry state so hard that they can be sawn and cut like wood." Economic Entomology, Aptera, p. 364.

No observations were made in regard to natural enemies except that a white mite resembling somewhat the figure of "an enemy of the blister mite" * was found October 13 upon one of the galls. A sufficient remedy would apparently be found in cutting off and burning the galls before the first of October.

As there seemed to be no record for America for the species of mites causing these galls, material was sent to Mr. P. J. Parrott through whose courtesy the following statements are made possible.

An examination of the material sent Mr. Parrott November 4 showed that the mites had left the flower galls but large numbers of Eriophyids were taken from the buds, in which the species responsible for the flower galls appear to hibernate. One of the two species present is *Eriophyes fraxini* (Karp.) Nal. which is said to cause flower galls on the European and the green ash in Europe. The other is a new species. This has been described by Mr. Hodgkiss and has been designated by him in his manuscript as *Eriophyes fraxiniphila.*

The brief description used here with the kind permission of Mr. Hodgkiss gives the following characters by which this mite may be recognized:

"Body long and narrow. Thoracic shield small. The dorsal setæ are of medium length and are widely separated. The legs are stout and the feathered hair has four rays. The thoracic setæ are present. The striæ on the dorsum and ventrum of the abdomen are narrow, closely punctured and number about seventy. Abdominal setæ are present. The third pair of thoracic setæ and the first and second pairs of ventral setæ are long. The females measure about 220 microns in length and about 40 microns in width, while the males average about 190 microns in length and 46 microns in width. The color of the mites varies from white with pinkish reflections to a deep salmon color in the hibernating forms."

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* *Seius pomi* Parrott. N. Y. Agric. Exp. Sta., Bul. 283, plate IV.

FIG 41.

FIG. 42.

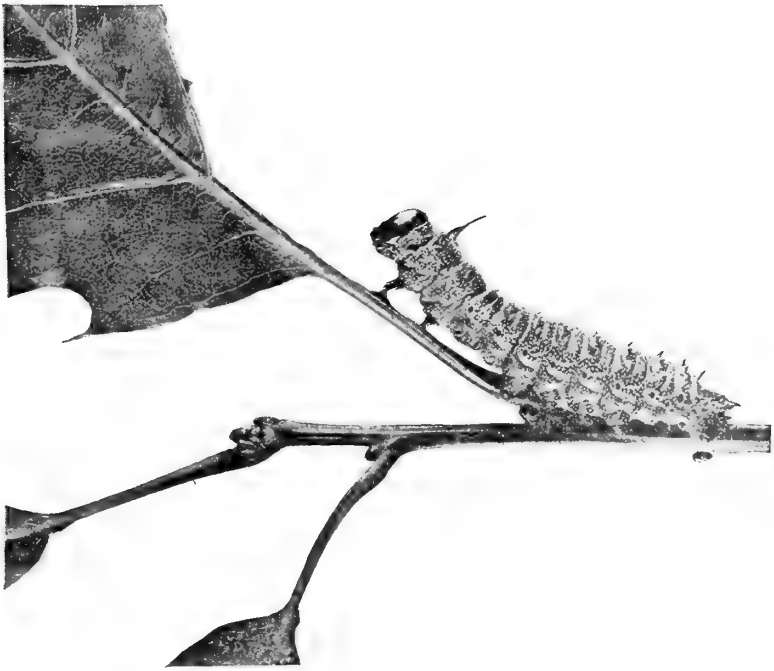

FIG. 43.

The Rosy-striped Oak-worm, Anisota virginiensis Fig. 41 male moth, Fig. 42 female moth, Fig. 43 full fed larva. See page 353.

FIGS. 44, 45 and 46.

Argyroploce abietana Fernald. A new spruce Tortrix and work of larvæ on spruce. See page 355.

FIG. 47.

Deilephila galli. Young sphinx as taken on introduced European plant, Galium verum, in Maine meadow. See page 356.

Fig. 48.

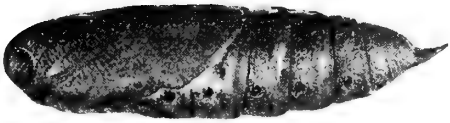

Fig. 49.

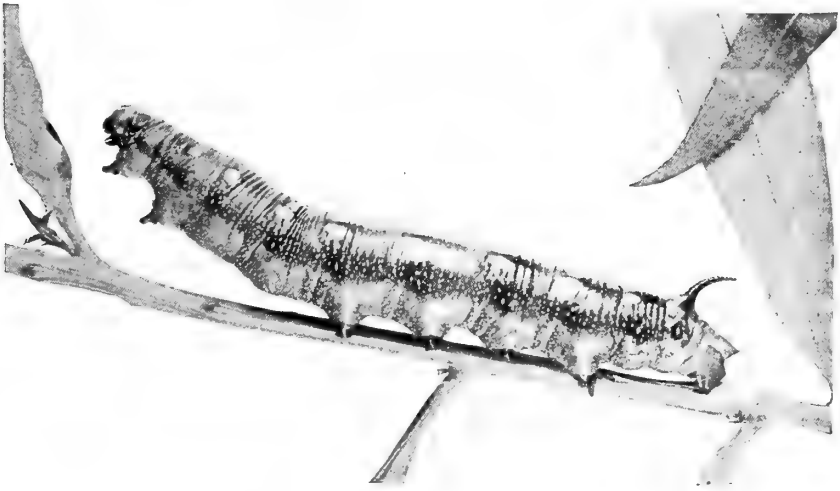

Fig. 50.

Deilephila galli, Sphinx. Fig. 48 moth, Fig. 49 pupa, Fig 50 full fed larva on fire weed. See page 356.

FIG. 51.

Basilona imperialis. Larva of Imperial Moth. See page 358.

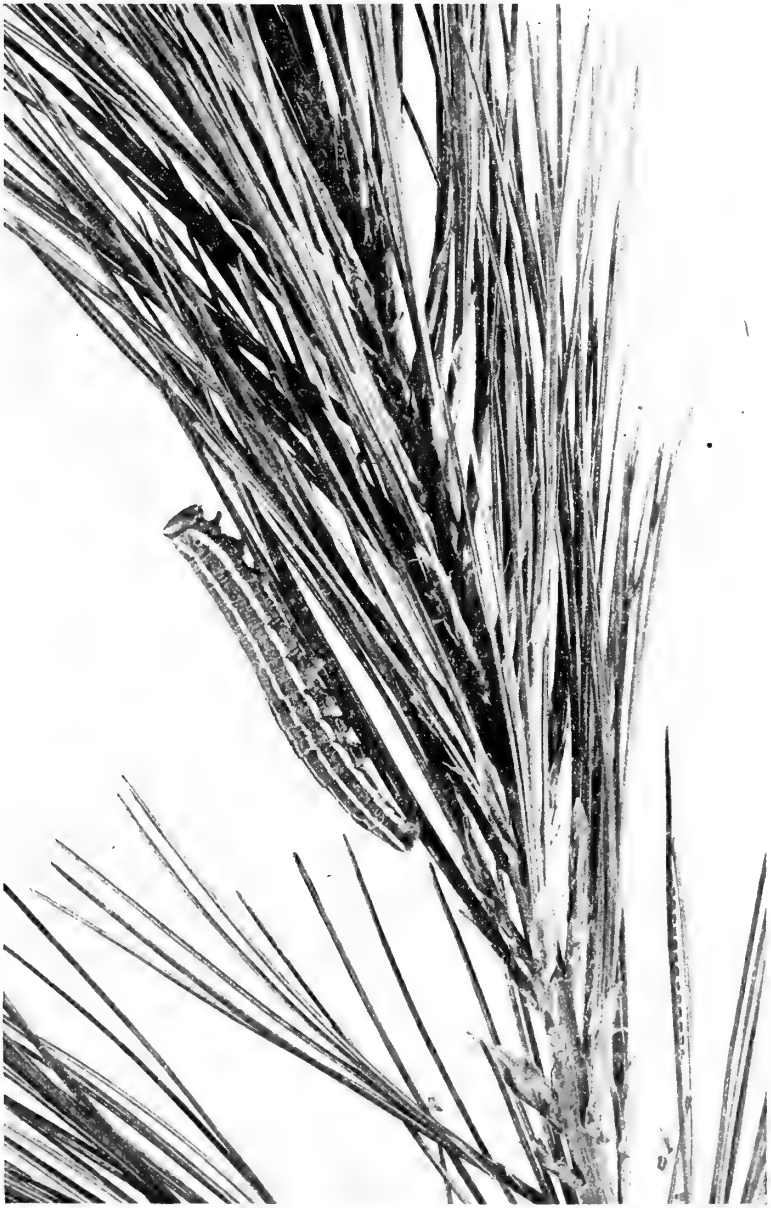

FIG. 52.

Lapara bomycoides. Larva of pine hawk-moth. See page 358.

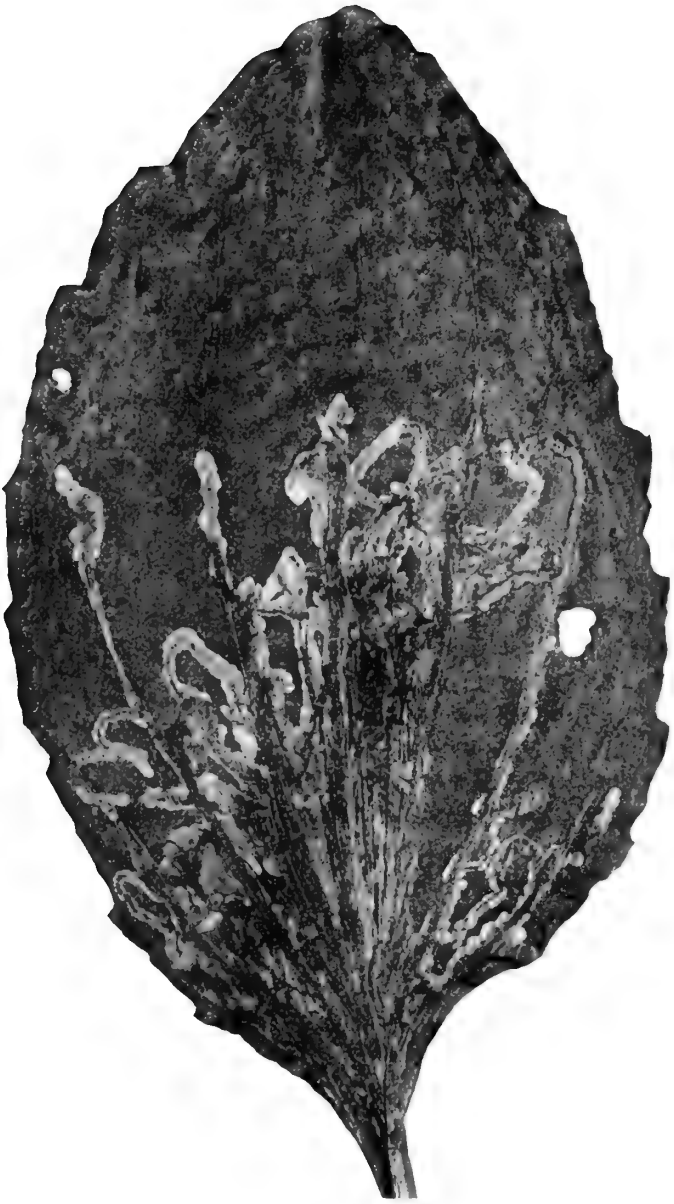

FIG. 53.

Dibolia borealis. Trails of leaf mining larvæ in leaf. See page 359.

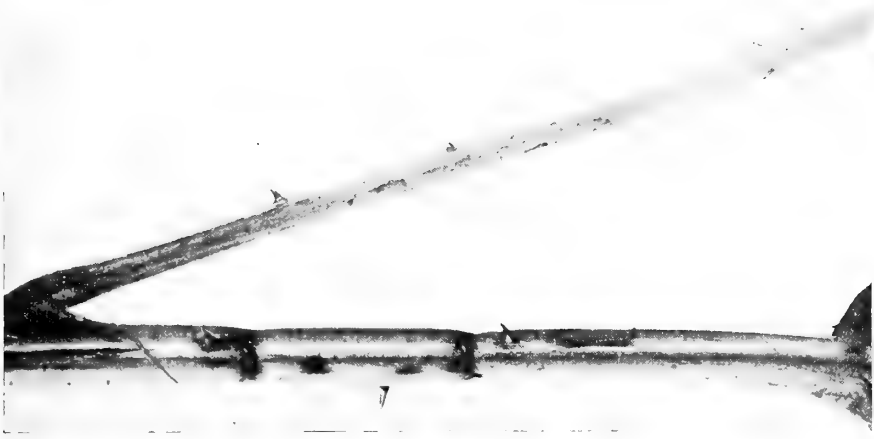

FIG. 54.

Oberea bimaculata. Work of adult beetle on blackberry cane. Enlarged. Orono, July 8, 1908. See page 359.

FIG. 55.

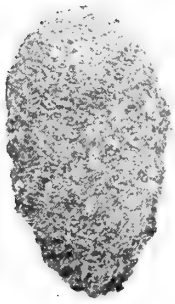

FIG. 56.

FIG. 57.

Osmoderma scabra. Fig 55 grub bred in decaying apple trunk. Fig. 56 cocoon. Fig 57 adult. See page 361.

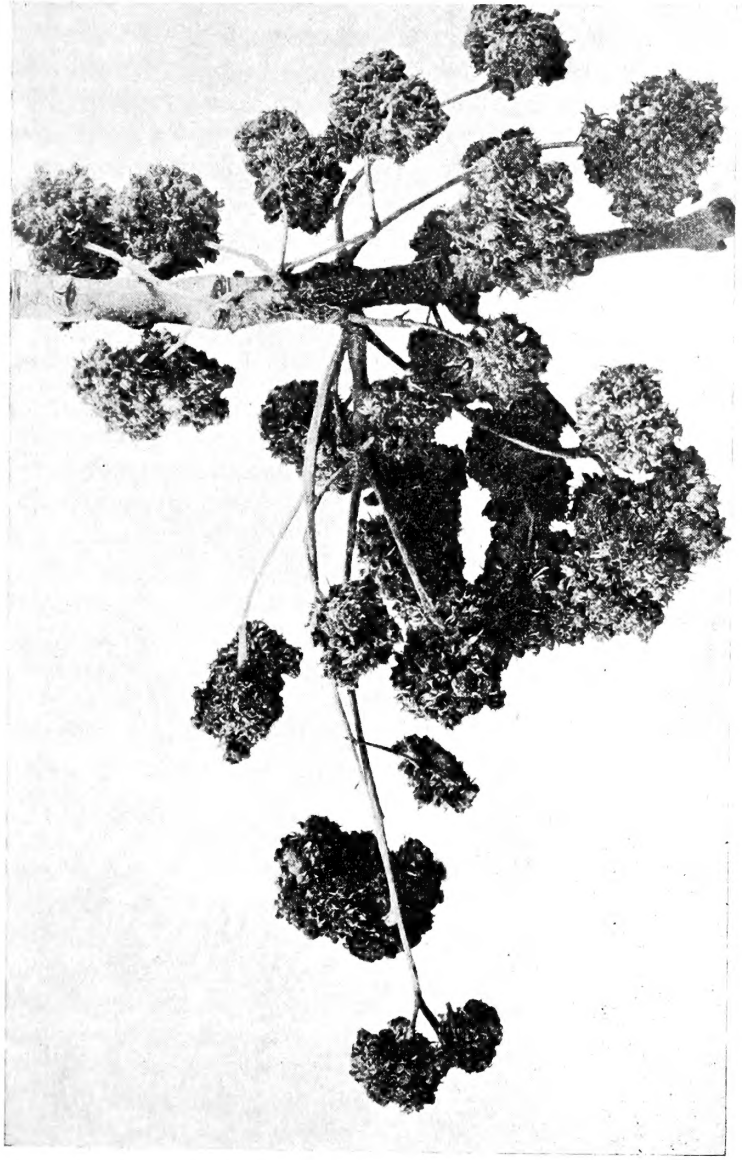

FIG. 58.

Ash clusters caused by gall mites. *Eriophyes* sp. See page 367.